"PATENT"

APPEAL BRIEF TRANSMITTAL FORM

Docket No.:	1998A017	)	
In re		)	BEFORE THE BOARD OF PATENT
Application of:	Grundy et al.	)	APPEALS AND INTERFERENCES
Serial No.:	09/040,911	)	
Filed:	March 18, 1998	)	Examiner: M. Medley
For:	FUEL OIL COMPOSITIONS	)	
		)	Group Art Unit No.: 1714

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

[X] The undersigned hereby certifies having information and a reasonable basis for belief that this correspondence will be deposited as first-class mail with the United States Postal Service in an envelope addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231, on November 7, 2003.

Enclosed is the Appeal Brief (in triplicate) in the above-noted application.

The item(s) checked below are appropriate:

[X] $330.00 Fee for Appeal Brief.

[ ] Petition for extension of time pursuant to 37 CFR 1.136 and 1.137 is hereby made if, and to the extent, required. The fee for this extension of time is calculated to be $ _____ t o extend the time for filing this paper until _____.

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November 7, 2003
Date of Signature

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Family No.: 1998A017	)	BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES
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APPEAL BRIEF

This Appeal Brief is filed in triplicate in support of an appeal (Notice of Appeal dated September 29, 2003) taken from the action of the Examiner in finally rejecting the claims in an Office Action dated June 30, 2003 and an Advisory Action dated September 30, 2003.

STATUS OF CLAIMS

Claims 1-3, 6, 7, 9, 10, 12-15 and 17 are all the claims remaining in this application and are all on appeal.

REAL PARTY IN INTEREST

The above-identified application was assigned by the inventors to Shell Oil Company, a corporation of Delaware.

RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences relating to this application and no decision in any other appeal or interference would impact the decision in the present appeal.

STATUS OF AMENDMENTS

Subsequent to the Final Rejection of June 30, 2003, an Amendment after Final Rejection was filed August 13, 2003 which cancelled claim 8 and argued the 35 U.S.C. §112 rejection of claims 6-8 and 12. The Advisory Action indicated that the Amendment after Final Rejection had overcome the rejection under 35 U.S.C. §112 and entered the amendment of the claims for the purpose of appeal.

SUMMARY OF THE INVENTION

The invention relates to a middle distillate fuel oil composition comprising a major amount of a liquid hydrocarbon middle distillate fuel oil having a sulfur concentration of at most 0.05% by weight and a minor proportion of a dispersant additive with the result that the fuel oil composition possesses enhanced engine and injector cleanliness due to the presence of the particular dispersant additive. The dispersant additive is obtained by reacting in a molar ratio in the range of 4:3 to 1:10, a polyalkenyl derivative of monoethylenically unsaturated C_4-C_{10} dicarboxylic acid material in which the number average molecular weight of the polyalkenyl side chain is in the range of 850 - 1150 with a polyamine of a specific formula as set forth in the claims.

The particular dispersant additive of the present invention is of a very restricted nature in terms of the ratio of components used to form the dispersant, a molecular weight in the nature of the amine used to provide the amine functionality. These are key aspects of the dispersant which provide the advantageous properties to the fuel oil composition which is demonstrated by applicants' data of a comparative nature in the example. The issue before the Board of Appeals is whether the claims

are unpatentable under 35 U.S.C. §103 on the basis of Gutierrez et al. WO 96/01854 combined with Wilson's "fuel lubricity".

ARGUMENT

Reversal is requested of the rejection of the claims under 35 U.S.C. 103(a) as being unpatentable over Gutierrez et al. in combination with Wilson. The claims were previously amended so as to require that the amines used to make the dispersants have no more than 5 nitrogens. This places the composition of the invention outside the scope of the Gutierrez et al. reference since Gutierrez, as set forth in line 30 of page 3, specifically requires that the polyamines used contain more than 6 nitrogens per molecule.

Appellants have surprisingly found that when a dispersant is prepared having the key parameters set forth in Claim 1, that is, a molar ratio within the range of 4:30 to 1:10, a polyalkenyl chain of 850 to 150 and a polyamine having a limited number of nitrogens as set forth in the claim, that a surprising dispersancy effect is observed when such dispersants are used with low sulfur fuels; comparative data clearly shows that the same effect is not obtained when the same dispersants are used with conventional high sulfur fuels.

The key issue here is whether Gutierrez et al. contains any suggestion as would motivate one to select particular dispersants set forth in the Appellants' claims and use them in a low sulfur fuel to obtain the unexpected result demonstrated by Appellants. On page 4 of the Final Rejection of June 30, 2003 the statement is made that "the skilled artisan would have been motivated with the teaching of Gutierrez to use a commercial TEPA or commercial PAM containing 3 to 5 nitrogen atoms that correspond to the nitrogen compound of the instant claims as the polyamine reactant for the dispersant additive, particularly if improved dispersancy was not a major concern in the fuel oil composition." Appellants fail to see any teaching in Gutierrez that supports this alleged motivation. Improved dispersancy is a concern in Appellants' invention and the improved dispersancy is illustrated by the data presented in the specification which measures improvements in cleanliness of injector

nozzles, and this improvement is obtained by using a narrowly defined dispersant additive category. The unexpected nature of the data is shown by comparing the dispersants of the invention with dispersants just outside the range of those claimed in the invention.

With respect to Gutierrez, neither the suggestion nor the expectation of success is found in this prior art reference. It is only found in Appellants' disclosure. Gutierrez, if anything, teaches that one would not expect to obtain improved results because of the plain statements made at page 4, line 15. Gutierrez indicates that dispersants with a high nitrogen content produced dispersants with improved dispersancy when compared to products derived from regular commercial PAM under similar conditions with the same polymer backbone. Similarly, at page 17, lines 1-2, the statement is made that the high nitrogen content dispersants made from heavy polyamine are superior to dispersants made from conventional polyamine mixtures. These statements must be given due consideration since they teach in a direction away from that achieved in accordance with the claims on appeal.

The detailed analysis of Appellants' examples and how they demonstrate the unobviousness of the invention is as follows:

In Table 3 on page 21, Examples 1 and 2 (employing dispersant additive 1 of the present invention at treat levels of 250 and 200 ppmw, respectively) produce Fouling Indexes (FI's) of 12 and 15 in the low sulfur fuel. In contrast, Comparative Examples III and IV with the same dispersant of the invention, but in high sulfur fuel oil, produces FI's of 19 and 22. Additionally, the FI's values of 12 and 15 for Examples 1 and 2 in low sulfur fuels are significantly better than the FI results (24 and 31) for a comparative dispersant A (Examples Comp 1 and Comp II) in the low sulfur fuel oil.

In Table 4 on page 23, Examples 3 and 4 with dispersant additives 1 and 2 of this invention produce FI's of 12 and 12, respectively, whereas Examples Comp. XI, XII and XIII, which differ only in the molecular weight of the polybutenyl chain being outside the claimed 850 to 1150 range (i.e., at 780, 750 and 1300, respectively),

produce FI's of 22, 19 and 26. Additionally, while Examples 3 and 4 both produce FI's of 12, similar dispersants in Comp. I and IX, but produced with coupling molar ratios of 1.5:1 and 2:1 (outside the claimed 4:3 to 1:10 range), produce FI's of 24 and 28. Also, while Examples 3 and 4 of the invention produce FI's of 12, a similar dispersant but of a polyamine outside the claims (namely, DAP - i.e., 3-dimethyl-aminopropylamine) produces a FI of 25.

In Table 5 on page 26, it will be seen that Examples 5 and 6 with dispersant additives of the invention produce FI's of 24 and 0.6, respectively, whereas Example Comp. XIV with an additive similar to the Example 5 additive but produced with a coupling ratio of 1.5:1 (outside the claim range), gave a FI of 28, and Example Comp. XV with an additive similar to the Example 6 additive, but produced with a polybutenyl chain of molecular weight of only 350, resulted in such severe fouling that the injector needles stuck in the nozzles.

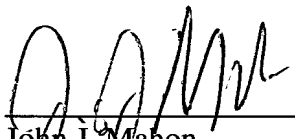
These examples demonstrate the inferior performance of the additives of the prior art disclosures for providing injector cleanliness as compared to the unexpectedly, unobviously superior cleanliness provided by the narrowly defined dispersant additives of the appealed claims in a low sulfur content middle distillate fuel oil.

Nothing in the cited references would suggest their modification to employ in combination, the bonding ratio of 4:3 to 1:10, a polyalkenyl chain of molecular weight of from 850 to 1150 and the specified polyamines in order to produce a detergent additive that exhibits significantly improved antifouling properties in low sulfur content middle distillate fuel oils. The prior art disclosure must teach the invention or motivate one skilled in the art to make the required modifications to arrive at the claimed invention. In re Carroll, 601 F.2d 1184, 1186, 202 USPQ 571, 572 (CCPA 1979); In re Clinton, 527 F.2d 1226, 1228, 188 USPQ 365, 367 (CCPA 1976). The prior art disclosure must be such that one of ordinary skill in the art would reasonably expect the method of the reference disclosure to be successful in producing the desired result. In re O'Farrell, supra. "Both the suggestion and expectation of success must be founded in the prior art, not in Applicant's disclosure." In re Dow Chemical

Co., supra. Nothing in the cited prior art disclosures would suggest or teach one skilled in the art to expect Appellants' claimed additives to possess the unexpectedly superior cleanliness (antifouling) properties in low sulfur content middle distillate fuel oil compared to the cleanliness (antifouling) properties of closely related but different dispersant additives as demonstrated in the afore-discussed comparative examples.

In view of the foregoing, reversal of the rejection is courteously requested.

Respectfully submitted,



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APPENDIX

1. A fuel oil composition comprising a major amount of a liquid hydrocarbon middle distillate fuel oil having a sulphur concentration of at most 0.05% by weight, and a minor proportion of a dispersant additive obtained by reacting, in a molar ratio A:B in the range 4:3 to 1:10, (A) a polyalkenyl derivative of monoethylenically unsaturated C_4-C_{10} dicarboxylic acid material in which the number average molecular weight (Mn) of the polyalkenyl chain is in the range from 850 to 1150 with (B) a polyamine of general formula

$$H_2N(CH_2)_m\text{-}[NH(CH_2)_m]_n\text{-}NH_2 \qquad (I)$$

wherein m is in the range from 2 to 4 and n is in the range from 1 to 3.

2. The fuel oil composition of Claim 1 wherein the polyalkenyl chain is derived from a polymer of at least one C_2-C_5 monoolefin.

3. The fuel oil composition of Claim 2 wherein the monoolefin is isobutylene.

6. The fuel oil composition of Claim 1 wherein the molar ratio A:B is in the range 6:5 to 1:2.

7. The fuel oil composition of Claim 2 wherein the molar ratio A:B is in the range 6:5 to 1:2.

9. The fuel oil composition of Claim 1 wherein the amount of dispersant additive is in the range of from 10 to 400 ppmw active matter based on total composition.

10. The fuel oil composition of Claim 2 wherein the amount of dispersant additive is in the range of from 10 to 400 ppmw active matter based on total composition.

12. The fuel oil composition of Claim 6 wherein the amount of dispersant additive is in the range of from 10 to 400 ppmw active matter based on total composition.

13. The fuel oil composition of Claim 1 wherein the amount of dispersant additive is in the range of from 40 to 200 ppmw active matter based on total composition.

14. The fuel oil composition of Claim 1 which additionally contains a lubricity additive in an amount in the range from 50 to 500 ppmw based on total composition.

15. A process for the preparation of the fuel oil composition of Claim 1 which comprises admixing the dispersant additive or an additive concentrate containing the dispersant additive with the fuel oil.

17. A method of operating a compression-ignition engine which comprises introducing into the combustion chambers of said engine the fuel oil composition of Claim 1.